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THE REPTILES AND BATRACHIANS OF McLENNAN  
COUNTY, TEXAS.

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McLennan is one of the north-central counties of Texas, with an area of 1,080 square miles. Waco, the county-seat, where most of my collecting has been done, is located in the central part, on the Brazos River, and has an elevation of something over 400 feet.

The eastern and southern portions are low. From Waco southward into Falls County, the country is rich bottom-land drained by the Brazos River and Tehuacana Creek and with occasional ponds and small grassy lagoons scattered here and there. The principal timber is post-oak and pecan. In this district, here denominated the post-oak country, three species of reptiles and a batrachian (*Anolis carolinensis* Cuvier, *Ophisaurus ventralis* L., *Tropidonotus fasciatus* L., and *Diemyctylus viridescens meridionalis* Cope) are found, that do not occur in other portions of the county. *Crotalus horridus* L. and *Eumeces quinelineatus* L. are rather common, although rare in other sections.

From Waco westward to Gatesville, Coryell County, the elevation steadily increases. At Hewitt, only nine miles from the city, the altitude is 656 feet, and at McGregor, eighteen miles distant, 713. The handsome ring-necked lizard (*Crotaphytus collaris* Say) has been collected in Coryell County only a short distance from the line and it is merely a matter of time when it will also be collected in McLennan.

The Bosque country is the name here used to designate the northwestern section in which is located the villages of Crawford and China Springs. This district commences at the Bosque

River, three miles north of Waco, and extends into Bosque County, in a northwesterly direction. The elevation at China Springs must be at least 250 feet higher than at Waco. This section is hilly and broken. *Holbrookia maculata lacerata* Cope is a species peculiar to it and my only specimens of *Sceloporus consobrinus* B. & G. and *Rhinochilus lecontei* B. & G. are from here.

In McLennan County the main water-course is the Brazos River, which runs through it in a southeasterly direction. On the east side, about nine miles south of Waco, Tehuacana Creek joins the river. The Bosque flows into the Brazos about three miles north of Waco. This stream is formed by three branches, the North, South, and Middle Bosque rivers. The North Bosque is the principal one of the three, flowing through from Bosque County on the northwest.

Childress Creek, in the northeastern section, runs into the Brazos River about six miles above the mouth of the Bosque. Waco Creek and Barron's Branch, two small streams, flow through Waco. The first mentioned is active about ten months of the year, but the second is hardly more than a wet-weather stream.

The Bosque system has a number of small tributaries, including Harris's, Bullhide, Flat-Rock, Hog, and Steele creeks.

At one time there was a good-sized grassy lagoon known as "Dry Pond," about two miles east of Waco. During my first few years of collecting this was my favorite resort. Here I collected my first specimens of *Elaps fulvius* and *Tropidonotus rhombifer* and witnessed a migration of turtles. About seven years ago the lagoon was drained and a levee thrown up and all the glories of my serpent "Eden" have departed.

A number of small natural and artificial lakes are scattered through the county. Most of these are owned and kept up by fishing clubs.

The "Laguna Lake" mentioned several times in this paper is a series of connecting lagoons in the northern part of Falls County, not far from the McLennan County line. Through the courtesy of Messrs. Polk Williamson, the former, and James H. Harrison, the present, president of the "Laguna Lake Club" I have been allowed to collect there on several occasions.

I first began collecting reptiles in the fall of 1893, but it was

five years later when I first made the attempt to form a permanent collection. The species collected prior to 1898 were exchanged for other material, so that, at the present time, my collection lacks four of the species enumerated. These are *Lithodytes latrans* Cope, *Diadophis regalis* B. & G., *Ambystoma opacum* Gravenh. and *Oscocota doliata doliata* L. of which only one specimen each has been collected. All of the other species are represented by from one to a dozen or more specimens. This collection is now the property of Baylor University.

A preliminary list of 59 species of McLennan County reptiles and batrachians was read before the Texas Academy of Science at its annual session in December, 1901, and was published in the Transactions of the Society for that year. One mistake occurs in this list. *Pseudemys concinna* LeConte should have been *P. texana* Baur or *P. elegans* Wied., both of which I have collected since 1901. I have ascertained that *P. concinna* does not occur in Texas. The *Pseudemys mobilensis* recorded from the State by several authors is probably *Pseudemys texana*, which has a wide range in Texas.

The present paper records 75 species and subspecies of reptilia and batrachia as occurring in McLennan County. Several subspecific names of doubtful validity used in my former paper are here discarded.

#### **Anolis carolinensis** Cuvier.

GREEN LIZARD.

The little pink-throated Anolis is exceedingly rare. In the spring of 1899 I collected two specimens about eight miles south of Waco, between the Brazos River and Tehuacana Creek. On June 12, 1906, Mr. Hurter and I obtained a third example in the woods bordering the north end of Laguna Lake.

#### **Holbrookia texana** Troschel.

TEXAN SPOTTED LIZARD.

This beautiful species is more or less abundant in suitable localities throughout the northern and western sections of the county. Its principal haunts are rock quarries and the banks of streams. It is especially abundant along Flat-Rock Creek, where it lives around and under large flat stones lying along the banks. In the fall months a large number of whipsnakes (*Zamenis flagellum*) resort to this place to feed on the lizards. I was once chasing an adult *Holbrookia* down the side of a steep bank, when a *Zamenis* darted out from behind a clump of weeds and seized the lizard and I captured both reptiles at the same time. The eggs are from eight to twelve in number and are deposited in hard ground to a depth of five

or six inches. The breeding season extends from May to August. Breeding females are brilliantly colored, the whole underparts being suffused with bright crimson. The nuptial colors in the male are sulphur yellow.

**Holbrookia maculata lacerata** Cope.

BOLL'S SPOTTED LIZARD.

Between China Springs and Crawford this lizard is rather common. In 1894 three specimens were collected on the Brazos River, near the mouth of the Bosque, but since that time no others have been found there. A female collected at China Springs in May deposited six eggs in the loose earth in the box it was confined in. These eggs are similar to those of *H. texana*, but are much smaller. The nuptial colors in this species are very brilliant.

**Sceloporus spinosus** Wiegmann.

TEXAS SCALY LIZARD; TREE SWIFT.

This large tree lizard is abundant along the wooded banks of rivers and streams. The adults bask on the trunks of rough-barked trees, at the slightest alarm ascending to the higher branches. In the fall young specimens are usually to be found around old logs and at the bases of rotten stumps. The eggs of this species range from four to eight in number, and are deposited under the bark or in crevices of fallen trees. Young specimens are very light in color but display the distinctive pattern of the adult at a very tender age. One afternoon in May, 1906, I shot forty adult specimens in one small grove near Waco Creek.

**Sceloporus consobrinus** Baird and Girard.

WESTERN FENCE LIZARD.

This lizard is quite rare. I have collected three specimens in the Bosque hills, in the northern part of the county. I was told that it also occurred in the eastern section, but specimens collected there prove to be young examples of *spinosus*.

**Phrynosoma cornutum** Harlan.

TEXAS HORNED "TOAD."

Common along roadsides and in grassy flats and fields. These little horned lizards feed principally on red ants, and some of the specimens I have dissected were fairly gorged with these pests. The usual number of eggs deposited by this species is twenty-four. On the 10th of July, 1906, Mr. Whipple, the engineer at the University, discovered a female *Phrynosoma* preparing her nest in the hard earth at the rear of the engine house. He notified me of his find and the next morning we provided ourselves with a spade and pair of heavy shears and went out to collect the set. The hole had been excavated to a depth of seven inches. The eggs formed a compact mass about  $2\frac{1}{2}$  inches across and an inch in depth and there was just enough dirt between to keep them from being in contact with each other. Another nest discovered at Gurley, Falls County, in the month of April, 1907, was quite different. The eggs were merely deposited in a small hollow, under cover of an old railroad tie, and had little or no dirt

to keep them separated. A number of these lizards breed in our athletic field each year, and from the 1st of August to the middle of September young specimens just out of the egg are exceedingly abundant.

**Opheosaurus ventralis** Linn.

GLASS SNAKE.

This animal is rare. A fine example in the University museum was collected six miles south of the city of Waco.

**Cnemidophorus gularis** Baird and Girard.

WESTERN LINED LIZARD.

Abundant, especially in the flats where they burrow under the roots of mesquite bushes. Femoral pores 16 to 19.

**Cnemidophorus sexlineatus** Linn.

SIX-LINED LIZARD.

I have collected a few typical specimens of this eastern species along the left bank of the Brazos River, between the First Street Cemetery and Gurley's bottom.

**Liolepisma laterale** Say.

GROUND LIZARD.

Very common in the bottoms, living among dead leaves and around and under stumps and fallen trees.

**Eumeces quinquelineatus** Linn.

RED HEAD; BLUE-TAILED LIZARD.

This lizard is rare in the immediate neighborhood of the city of Waco, but in the post-oak country it is as common as *Sceloporus spinosus*.

**Eumeces obsoletus** Baird and Girard.

WESTERN SKINK.

Three half-grown examples of this species were collected among rocks, not far from McGregor.

**Glauconia dulcis** Baird and Girard.

WORM SNAKE.

On July 22, 1907, Mr. W. T. Gooch found a specimen of this species lying dead in a path on the Baylor Campus, only a stone's throw from the Science Hall. It was in a preservable condition and could not have been dead over an hour at the outside.

**Diadophis regalis** Baird and Girard.

WESTERN RING-NECKED SNAKE.

One specimen from near Dry Pond, in east Waco. In this paper, following Arthur Erwin Brown, I drop the subspecific name *arnyi*, which I formerly applied to this snake. Cope clearly admitted that *arnyi* was merely a color variation.\*

\* "Crocodilians, lizards and snakes of North America," p. 745 ("Resembles *D. regalis*, from which it will be distinguished by color").

**Heterodon platyrhinus** Latreille.

BLOWING ADDER.

This species is rather common in the Brazos-Tehuacana bottoms, but rare in the immediate neighborhood of Waco.

**Cyclophis aestivus** Linn.

SOUTHERN GREEN SNAKE.

Tolerably common in the wooded Brazos and Bosque bottoms.

**Zamenis constrictor** L.

BLACK SNAKE; RACER.

This species in its typical form is exceedingly rare. One specimen from the Bosque hills north of Waco was a typical *constrictor*, black, with slate-colored belly. All of the other specimens I have seen were referable to the following subspecies:

**Zamenis constrictor flaviventris** Say.

YELLOW-BELLIED RACER.

Two specimens of this variety from the prairie district between Waco and McGregor, three from the Symes farm on the Brazos about ten miles south of the city, and a single example from Proctor Springs were olive-green with the under surfaces bright yellow.

**Zamenis flagellum** Shaw.

COACHWHIP SNAKE; PRAIRIE RUNNER.

A common species in the prairie districts. This is one of our most beneficial serpents, for while they destroy a good many lizards, they more than make up for it by the number of locusts they consume. I have collected examples that were fairly gorged with specimens of *Schistocerca americanum*.

**Coluber spiloides** Dumeril and Bibron.

TEXAS PILOT SNAKE.

Abundant wherever there are wooded tracts and one of our most harmful species. On account of their expertness in climbing trees, they annually destroy large numbers of young birds. I have known them to almost depopulate a small colony of Cliff Swallows, and on one occasion killed a specimen that had just swallowed a female scissor-tailed flycatcher and her eggs.

**Coluber obsoletus lindheimeri** Baird and Girard.

LINDHEIMER'S PILOT SNAKE.

My friend, Mr. J. P. Bahl, kindly presented me with a fair sized specimen of this bright colored pilot snake which he collected near McGregor. This is my only record for the county.

**Pityophis catenifer sayi** Schlegel.

BULL SNAKE.

This species is not uncommon in the prairie district between Waco and McGregor. I once witnessed an aerial combat between a snake of this

species and a large hawk. The hawk had carried the serpent some distance from the ground, but the latter squirmed so vigorously and struck at its captor so furiously that the bird was forced to relinquish its hold. When the reptile struck the ground I supposed that it would be too badly stunned to move, but on my reaching the spot where it had fallen I was just in time to see it dragging its body slowly down the burrow of some fossorial mammal.

**Lampropeltis doliiatus doliiatus** L.

SCARLET SNAKE.

I collected a specimen of this beautiful species nearly ten years ago, but I have never been able to find a second one.

**Lampropeltis calligaster** Say.

EVANS' KING SNAKE.

This species, one of the handsomest of North American serpents, is exceedingly rare in McLennan County, which locality, I believe, marks the southern limit to its range.\* The specimen from Waco in the U. S. National Museum (No. 21,486) and one other now in the Baylor University collection, are the only examples of the species I have ever captured. In life, the blotches on the upper surface of this species vary from deep chestnut brown to deep red, in different specimens.

**Lampropeltis getula sayi** Holbrook.

WESTERN KING SNAKE.

The king or "speckled" snake is rather common. In Waco examples the markings are seldom in the form of bands, but the whole upper surface is minutely speckled with small yellow dots. My observations indicate that this species feeds entirely upon other snakes.

**Rhinochilus lecontei** Baird and Girard.

LE CONTE'S SNAKE.

I captured one specimen of this beautiful snake about midway between Waco and China Springs. Two other serpents which I supposed to be this species were seen in the same locality.

**Tropidonotus rhombifer** Hallowell.

DIAMOND WATER SNAKE.

This handsomely marked water snake is common in tanks and lagoons. Along the creeks, however, it is less abundant than *T. transversus*.

**Tropidonotus sipedon transversus** Hallowell.

HALLOWELL'S WATER SNAKE.

Our most abundant water snake. The specimen listed in my former paper as *T. erythrogaster* Shaw was probably an obsoletely marked example of this subspecies. A number of adult specimens of *transversus*

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\* Since the above was written I have seen Cope's record of a specimen collected at Fort Davis, Jeff Davis County. This would indicate that its range extends south almost to the Rio Grande River.

collected at Waco and Burnet during the summer of 1906 show hardly any trace of the distinctive markings of this variety, but vary from muddy yellow to brick red in color. This leads me to believe that *erythrogaster* is merely the adult form of *transversus*.

**Tropidonotus sipedon fasciatus** Linn.

RED-BELLIED WATER SNAKE.

This fine snake is not found at Waco, but I have obtained specimens in the Tehuacana bottoms. At Laguna Lake it is fully as common as *T. rhombifer*. Living specimens are brilliantly colored, deep shades of red and yellow prevailing.

**Tropidonotus grahami** Baird and Girard

GRAHAM'S WATER SNAKE.

Exceedingly rare. Some years ago I captured one specimen near the mouth of the Bosque River, and in April, 1906, collected a second example at Laguna Lake. The Laguna specimen was found coiled up under the bark of a rotten log.

**Storeria dekayi** Holbrook.

DE KAY'S SNAKE.

This small species, while tolerably common around Waco, is much more abundant in the post-oak country and at Laguna Lake.

**Haldea striatula** L.

BROWN SNAKE.

This little snake is quite common under logs and among masses of decaying wood, in thickly timbered bottoms. Waco examples are grayish-brown above, yellowish-white beneath.

**Tropidoclonium lineatum** Hallowell.

This species is abundant in the city limits of Waco, and almost every large woodpile and old building has its quota of specimens. After a big fire I collected 27 specimens around the water-soaked debris and am satisfied that I could have obtained many more had I tried.

**Salvadora grahamiae** Baird and Girard.

GRAHAM'S SNAKE.

An adult specimen from west of Waco is in the Baylor University collection. A friend gave me a living specimen some years ago, but it escaped before I had time to consign it to spirits. These two examples are the only ones I have any record of.

**Eutaenia proxima** Say.

SAY'S GARTER SNAKE.

This species is our commonest garter snake, and as a rule is the least variable. In life the dorsal stripe is usually a rich red in color.



**Eutaenia marciana** Baird and Girard.

MARCY'S GARTER SNAKE.

In May, 1897, I captured an adult specimen of a spotted garter snake on the flats west of Waco and sent it, with other material, to my friend, C. S. Brimley, of Raleigh, N. C. Brimley identified it as *marciana* and sold it to a German Museum under that name; but afterwards expressed himself as being a little doubtful of the identification. Since then I have collected good series of typical *marciana* in western and southern Texas, and have been satisfied for a long time that Brimley's original identification was correct, but nevertheless was highly pleased when two more fine specimens from Waco were brought in last November. One of these was found under a pile of old lumber on the University campus.

**Eutaenia eques** Reuss.

REUSS' GARTER SNAKE.

I have collected about six specimens in the country during the past ten years. The difference between examples from central and western Texas is very marked, and Cope was fully justified in recognizing two color varieties.

**Eutaenia sirtalis sirtalis** Linn.**Eutaenia sirtalis parietalis** Say.

Garter snakes of the *sirtalis* type are exceedingly rare in this section of Texas, and it is almost impossible to find a perfectly typical specimen of either of the above subspecies. In my former paper I referred two *Eutaenias* to *dorsalis* Baird and Girard, which name is a synonym of *parietalis* Say. One of these was a fairly typical specimen of Say's subspecies, but I made my reference to the other with considerable doubt as it seemed very like *sirtalis*, although I had been led to believe, through my reading, that the typical subspecies was not found in this part of Texas. In answer to a letter of inquiry written to Dr. A. E. Brown, Director of the Zoological Society of Philadelphia, regarding some of his authorities, I was referred to one of Cope's papers which recorded the occurrence of *E. sirtalis sirtalis* near Dallas. Since that time I have collected three specimens, all of which are referable to *sirtalis*.

**Tantilla gracilis** Baird and Girard.

GRACEFUL TANTILLA.

This species must be very rare here as I have found but one during all my years of collecting. In life this specimen was light golden-brown above, reddish underneath.

**Elaps fulvius** Linn.

HARLEQUIN SNAKE.

This handsome snake is not uncommon. Damp places near springs and the vicinity of small streams are its favorite resorts, for in these places its food, which consists largely of other snakes, is usually abundant. In

one of these specimens I dissected I found three adult *Haldea striatula*. Another one contained a small *Tropidonotus*.

**Ancistrodon piscivorus** Lacepede.

COTTON MOUTH.

Tolerably common around Waco, but is much more abundant in the post-oak country and at Laguna. Specimens from central Texas are much darker than those from further east, and the bands never display reddish tints. I have never found more than seven embryos in any of the females I have dissected.

**Ancistrodon contortrix** Linn.

COPPERHEAD.

Tolerably common in the wooded river bottoms, but of late years has become very scarce in the more cultivated districts.

**Sistrurus miliarius** Linn.

GROUND RATTLESNAKE.

On August 5, 1907, while we were camped at Mussel Island on the North Bosque River, Gooch found a specimen of this pretty little rattlesnake under an old newspaper lying in the middle of our camp.

**Crotalus atrox** Baird and Girard.

TEXAS RATTLESNAKE.

The Texas rattlesnake is exceedingly rare. In July, 1905, a large specimen over six feet in length was killed near China Springs and brought to Waco.

**Crotalus horridus** Linn.

BANDED RATTLESNAKE.

In my former paper I recorded one specimen of this rattlesnake. Since then I have discovered that it is the prevailing form of *Crotalus* in this section of central Texas. It is rather common in the post-oak country between Waco and Laguna. It also occurs near China Springs, and I have had one specimen from McGregor. The specimens I have examined have shown considerable variation in color. In life the ground color of one was light buff, a second, bright yellowish tawny, and a third (now in the Baylor Museum) light salmon.

**Pseudemys texana** Baur.

TEXAN TURTLE.

This fine turtle is probably rare, as I have only collected two examples. One of these was caught in the Bosque River, in a seine; the other one was found in a fisherman's net at Laguna.

**Pseudemys elegans** Wied.

ELEGANT TURTLE.

Common in most of our streams and rivers; exceedingly abundant at Laguna Lake.

**Gratemys geographica** LeSueur.

MAP TURTLE.

Rare. My first record was based on a poorly preserved specimen found in a lot of material collected by Prof. O. C. Charlton. Afterwards I captured two specimens in the North Bosque River.

**Terrapene ornata** Agass.

PAINTED BOX TORTOISE.

Very common on the flats west of the city of Waco. At one time I had three specimens of this species and made it a rule to feed them regularly at the same hour each day. Finally I turned them loose in my back yard and every evening about six o'clock they would come to me to be fed. It was laughable to watch them as they stood on their hind legs, scratching at my shoes and the bottom of my trousers in their endeavor to attract my attention. I fed them on raw beef cut into strips, and as soon as their appetites were satisfied they would go back to their quarters under the coal shed and I would not see them again until about the same time the next evening. The natural diet of this species consists of vegetable matter and earthworms.

**Chelydra serpentina** Linn.

SNAPPING TURTLE.

Tolerably common in the Brazos and Bosque Rivers.

**Kinosternon flavescens** Agass.

YELLOW MUD TURTLE.

I have only collected two examples of this species in McLennan County. One of these was found half buried in the mud of a small prairie sink, the other was captured on the dam at Day's Lake.

**Kinosternon louisianae** Baur.

LOUISIANA MUD TURTLE.

This species is abundant in the lagoons and streams. In 1893 I witnessed a migration of these turtles at Dry Pond. The marsh was rapidly drying up, and as I walked along the levee I counted 45 specimens all headed in the same direction. At first I thought that they were merely changing their quarters to the ditch along the railroad track only about 200 yards away, but found that there was very little water there, and that turtles were scattered all over the damp meadow on the other side. I followed the line of march and discovered that they were headed for a large tank over half a mile from Dry Pond.

**Aromochelys tristycha** Agass.

TEXAS MUSK TURTLE.

This turtle is rare in the neighborhood of Waco, but very common at Laguna Lake.

**Aspidonectes emoryi** Baird and Girard.

EMORY'S SOFT-SHELL TURTLE.

This fine soft-shell turtle is abundant in the Brazos and Bosque Rivers.

**Ambystoma microstomum** Cope.

SMALL-MOUTHED SALAMANDER.

This salamander is rather rare in the immediate neighborhood of Waco, but is quite common in the Tehuacana bottoms and at Laguna.

**Ambystoma texanum** Matthes.

TEXAN SALAMANDER.

My only example of this rare species was found about five miles south of Waco. The following is a brief description of this specimen:

Baylor University Museum (Strecker collection, No. 2316). Total length, 119 mm. Length to vent,  $62\frac{1}{2}$  mm. Color, light brown above, sides and under parts yellow; traces of light spots between the costal grooves. Head oval, rather flattened and broad; fourteen distinct costal folds; a distinct median dorsal groove. When the fore and hind legs are extended and appressed to the sides they are separated by four of the intercostal spaces (six in *A. microstomum*). Width of head at jaws contained four times in total length to groin (six and a half times in *microstomum*).

**Ambystoma opacum** Gravenhorst.

MARBLED SALAMANDER.

The specimen from Hewitt mentioned in my former paper constitutes my only record for this handsome species.

**Plethodon glutinosus** Green.

VISCID SALAMANDER.

Exceedingly rare. I have one specimen from the Tehuacana bottom. This makes the second one I have collected in the county.

**Diemyctylus viridescens meridionalis** Cope.

TEXAS NEWT.

This newt is by no means a common species. During the last two years a few examples have been caught in small lagoons east and south of Waco. Mr. Hurter and I obtained a few specimens at Laguna Lake in June, 1906.

**Scaphiopus couchii** Baird and Girard.

COUCH'S SPADE-FOOT.

After the first heavy rain in April or May these interesting batrachians come forth from their burrows and make the streets of Waco resound with their loud cries. As a rule they delay their appearance until about dusk, but I have known them to come out as early as three o'clock in the afternoon. The male makes quite a conspicuous object when he has his vocal vesicle fully distended. They breed in temporary pools, usually going into the water in April and May. The eggs are in strings and are attached to weeds or grass after the manner of those of some *Bufo*s. During the past fourteen years I have handled a great number of these burrowing toads. The most of these were collected in their breeding pools, but specimens are brought in every few days from March to November, by persons who dig them up while working in their gardens and flower

pits. In damp weather I have found a few specimens around the electric lights in company with *Bufo compactilis* and *Bufo americanus*. In life the ground color in different examples of this species varies from yellow-green to dark green. Most of the male specimens are of the cross-barred type.

**Lithodytes latrans** Cope.

ROBBER FROG; BARKING FROG.

In 1899 I captured one of these curious little frogs. I found it hopping along a gutter an hour or two after a heavy shower. This species is said to inhabit rocky places. On one occasion while I was working the limestone bluffs along Flat Rock Creek I saw two frogs that I am satisfied were of this species, but they escaped by jumping into a deep crevice, and I was without the necessary implements to get them out. The ground color of the upper surface, in my specimen, was light green.

**Bufo lentiginosus americanus** LeConte.

AMERICAN TOAD,

Our common toads are a puzzling lot. Some seem to be typical *americanus*, others are near *woodhousei*, while a third type, represented by a few light-colored specimens, show many characteristics of *cognatus*. I lump them all under the same head at present, intending later on to make a more critical examination of our extensive series of toads of this species.

**Bufo valliceps** Wiegmann.

NEBULOUS TOAD.

This interesting and peculiar species is rather common but less so than specimens of the *americanus* type. I capture quite a number around electric lights and have no difficulty in selecting them from among the numerous specimens of other species, on account of their alert manner and the peculiar upright position they assume when in repose. At some points along the rocky banks of some of the small streams tributary to the Bosque River I have found these toads in considerable numbers. Here they inhabit caves and fissures in the soft shaly stone, and feed largely on the long-legged monstrosities commonly known as "grand-daddies."

**Bufo debilis** Wiegmann.

GREEN TOAD.

The habits of this interesting little species resemble those of *Scaphiopus couchii* in many respects. They are night-prowlers, seldom moving around until after dark, then coming forth from their burrows under the roots of mesquite trees on the grassy flats, in quest of their food. In life the ground color of the upper surface in this species varies from light to dark-green, while the underparts are soiled yellowish white. The throat pouch, in the male, is blackish. In this locality I have only collected four or five specimens outside of the mesquite flats. Like the spade-foot, they breed in temporary pools, and after a heavy rain their presence can soon be detected by their peculiar, long-drawn, bird-like notes. I collected twenty-four pairs in copula on the banks of one small ditch.

**Bufo punctatus** Baird and Girard.

SPOTTED TOAD.

This is our rarest *Bufo*. In the fall of 1904 I found my first specimen under a log in the Brazos bottom. Two years later my friend Rohrer collected a second example, and in May, 1907, I captured a third. The last specimen was collected at night, in a ditch in which numerous specimens of *Scaphiopus couchii*, *Bufo debilis*, and *Engystoma carolinense* were breeding.

**Bufo compactilis** Wiegmann.

SPADE-FOOTED TOAD.

This is another toad of peculiar habits and on this account was long overlooked. In June, 1905, I found two specimens among some trash, in the small park across the creek from the University. The next month I obtained two more which were attracted by the light of the lantern I was using while sugaring for moths, near the same place. These specimens were all collected in damp weather. In May, 1906, I decided to keep a sharp lookout for this species and spent two nights in collecting around the electric lights, but the only toads I found were specimens of *americanus* and *valliceps*. A few days later we had a series of heavy rains and I tried my luck again, with the result that I collected twenty-five specimens of *compactilis* in less than two hours. Since then I have obtained a great many more, but always in damp weather.

**Hyla cinerea** Daudin.

GREEN TREE-FROG.

This beautiful green tree-frog is not common in the near vicinity of Waco, but it is quite abundant in the post-oak country and at Laguna Lake.

**Hyla versicolor chrysocelis** Cope.

WESTERN TREE-FROG.

This variety of the common eastern tree-frog is exceedingly rare in central Texas. During my fourteen years of collecting in this county I have only captured three examples.

**Chorophilus triseriatus** Wied.

STRIPED TREE-FROG.

Two color varieties of this species occur in the vicinity of Waco—a large spotted form and the ordinary striped one. In April when these frogs go into the water to breed they fairly swarm in the marshes. On one occasion I collected more than forty specimens at Dry Pond in less than an hour's time. I formerly considered the spotted specimens as representing a subspecies (*C. triseriatus clarkii* Baird and Girard), but the examination of a large series of examples from Illinois and Texas convinces me that this variety is not worthy of recognition. I have found *Chorophilus triseriatus* breeding in temporary pools as well as more permanent bodies of water.

**Acris gryllus crepitans** Baird and Girard.

WESTERN CRICKET FROG.

Abundant along all of our water courses. Waco specimens of this subspecies are very variable in color, but seldom display greenish tints.

**Engystoma carolinense** Holbrook.

NARROW-MOUTHED TOAD.

Two types (or varieties, they might possibly be called) of this species occur here, and both appear to be equally common. Type A is greenish-gray in color, with the skin almost smooth; type B is darker, varying from brown to almost black, and with the skin more tubercular. At the present time I refer both of these varieties to *carolinense*, intending to investigate the matter thoroughly as soon as the spring season opens up.

**Rana pipiens** Schreber.

LEOPARD FROG.

Very abundant in suitable localities. The examination of a large series of frogs of the *Rana pipiens* type from different sections of Texas will probably convince us of the necessity of recognizing one or two of the subspecies described by Cope. *Rana pipiens* Schreber (= *R. virescens* Kalm) in its typical form doubtless occurs in all of the eastern and north-central counties, but specimens I have examined from the southern part of the State, east of San Antonio, are the short-headed type (*Rana virescens brachycephala* Cope). Examples from west of the Pecos would probably be referred to the Mexican form described by Cope under the name of *Rana virescens austriicola*.

*Rana sphenocephala* Cope, as at present defined, is probably a distinct species.

**Rana sphenocephala** Cope.

SOUTHERN LEOPARD FROG.

In working over my series of leopard frogs I find two specimen that are clearly referable to this variety (or species?). They were collected in July, 1907, on the east side of the Brazos River, in the wooded strip between that stream and Tehuacana Creek.

**Rana catesbiana** Shaw.

BULL FROG.

This species is not uncommon in the lagoons and along the larger water courses. Last year Rohrer and I captured a half-grown specimen from among a lot of toads that were congregated around an electric light, fully four blocks from the nearest creek. At the same time we saw another specimen but failed to secure it.